

$N(2250) \ 9/2^-$

$$I(J^P) = \frac{1}{2}(\frac{9}{2}^-) \text{ Status: } ****$$

Some obsolete results published before 1980 were last included in our 2006 edition, Journal of Physics, G **33** 1 (2006).

NODE=B113

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→ UNCHECKED ←

***N*(2250) BREIT-WIGNER MASS**

<i>VALUE</i> (MeV)	<i>DOCUMENT ID</i>	<i>TECN</i>	<i>COMMENT</i>
2200 to 2350 (≈ 2275) OUR ESTIMATE			
2280 ± 40	ANISOVICH	12A	DPWA Multichannel
2302 ± 6	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
2250 ± 80	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
2268 ± 15	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
2200 ± 100	HENDRY	78	MPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
2376 ± 43	ARNDT	04	DPWA $\pi N \rightarrow \pi N, \eta N$
2291	ARNDT	95	DPWA $\pi N \rightarrow N\pi$

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***N*(2250) BREIT-WIGNER WIDTH**

<i>VALUE</i> (MeV)	<i>DOCUMENT ID</i>	<i>TECN</i>	<i>COMMENT</i>
230 to 800 (≈ 500) OUR ESTIMATE			
520 ± 50	ANISOVICH	12A	DPWA Multichannel
628 ± 28	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
480 ± 120	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
300 ± 40	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
350 ± 100	HENDRY	78	MPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
924 ± 178	ARNDT	04	DPWA $\pi N \rightarrow \pi N, \eta N$
772	ARNDT	95	DPWA $\pi N \rightarrow N\pi$

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***N*(2250) POLE POSITION**

REAL PART

<i>VALUE</i> (MeV)	<i>DOCUMENT ID</i>	<i>TECN</i>	<i>COMMENT</i>
2150 to 2250 (≈ 2200) OUR ESTIMATE			
2195 ± 45	ANISOVICH	12A	DPWA Multichannel
2217	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
2187	¹ HOEHLER	93	SPED $\pi N \rightarrow \pi N$
2150 ± 50	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
2238	ARNDT	04	DPWA $\pi N \rightarrow \pi N, \eta N$
2087	ARNDT	95	DPWA $\pi N \rightarrow N\pi$
2243	ARNDT	91	DPWA $\pi N \rightarrow \pi N$ Soln SM90

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−2×IMAGINARY PART

<i>VALUE</i> (MeV)	<i>DOCUMENT ID</i>	<i>TECN</i>	<i>COMMENT</i>
350 to 550 (≈ 450) OUR ESTIMATE			
470 ± 50	ANISOVICH	12A	DPWA Multichannel
431	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
388	¹ HOEHLER	93	SPED $\pi N \rightarrow \pi N$
360 ± 100	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
536	ARNDT	04	DPWA $\pi N \rightarrow \pi N, \eta N$
680	ARNDT	95	DPWA $\pi N \rightarrow N\pi$
650	ARNDT	91	DPWA $\pi N \rightarrow \pi N$ Soln SM90

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***N*(2250) ELASTIC POLE RESIDUE**

MODULUS $|r|$

<i>VALUE</i> (MeV)	<i>DOCUMENT ID</i>	<i>TECN</i>	<i>COMMENT</i>
26 ± 5	ANISOVICH	12A	DPWA Multichannel
21	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
21	HOEHLER	93	SPED $\pi N \rightarrow \pi N$
20 ± 6	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

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• • • We do not use the following data for averages, fits, limits, etc. • • •

33	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
24	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
47	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90

PHASE θ

VALUE (°)	DOCUMENT ID	TECN	COMMENT
-38 ± 25	ANISOVICH	12A	DPWA Multichannel
-20	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
-50 ± 20	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

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• • • We do not use the following data for averages, fits, limits, etc. • • •

-25	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
-44	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
-37	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90

$N(2250)$ DECAY MODES

NODE=B113225;NODE=B113

The following branching fractions are our estimates, not fits or averages.

NODE=B113

Mode	Fraction (Γ_i/Γ)
Γ_1 $N\pi$	5-15 %
Γ_2 $N\eta$	
Γ_3 ΛK	

DESIG=1;OUR EST

DESIG=2

DESIG=3

$N(2250)$ BRANCHING RATIOS

NODE=B113230

$\Gamma(N\pi)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	Γ_1/Γ
VALUE (%)				
5 to 15 OUR ESTIMATE				
12 \pm 4	ANISOVICH	12A	DPWA Multichannel	
8.9 \pm 0.1	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$	
10 \pm 2	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$	
10 \pm 2	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$	
9 \pm 2	HENDRY	78	MPWA $\pi N \rightarrow \pi N$	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
11.0 \pm 0.4	ARNDT	04	DPWA $\pi N \rightarrow \pi N, \eta N$	
10	ARNDT	95	DPWA $\pi N \rightarrow N\pi$	

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$(\Gamma_i/\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\pi \rightarrow N(2250) \rightarrow \Lambda K$	DOCUMENT ID	TECN	COMMENT	$(\Gamma_1/\Gamma_3)^{1/2}/\Gamma$
VALUE				
-0.02	BELL	83	DPWA $\pi^- p \rightarrow \Lambda K^0$	
not seen	SAXON	80	DPWA $\pi^- p \rightarrow \Lambda K^0$	

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$N(2250)$ PHOTON DECAY AMPLITUDES

NODE=B113240

Papers on γN amplitudes predating 1981 may be found in our 2006 edition, Journal of Physics, G **33** 1 (2006).

NODE=B113240

$N(2250) \rightarrow p\gamma$, helicity-1/2 amplitude $A_{1/2}$

VALUE ($\text{GeV}^{-1/2}$)	DOCUMENT ID	TECN	COMMENT
<0.01	² ANISOVICH	12A	DPWA Multichannel

NODE=B113A1
NODE=B113A1

$N(2250) \rightarrow p\gamma$, helicity-3/2 amplitude $A_{3/2}$

VALUE ($\text{GeV}^{-1/2}$)	DOCUMENT ID	TECN	COMMENT
<0.01	² ANISOVICH	12A	DPWA Multichannel

NODE=B113A2
NODE=B113A2

$N(2250)$ FOOTNOTES

NODE=B113

¹ See HOEHLER 93 for a detailed discussion of the evidence for and the pole parameters of N and Δ resonances as determined from Argand diagrams of πN elastic partial-wave amplitudes and from plots of the speeds with which the amplitudes traverse the diagrams.

NODE=B113;LINKAGE=H9

² This ANISOVICH 12A value is the complex helicity amplitude at the pole position.

NODE=B113A1;LINKAGE=AN

N(2250) REFERENCES

NODE=B113

ANISOVICH	12A	EPJ A48 15	A.V. Anisovich <i>et al.</i>	(BONN, PNPI)	REFID=54041
ARNDT	06	PR C74 045205	R.A. Arndt <i>et al.</i>	(GWU)	REFID=51535
PDG	06	JPG 33 1	W.-M. Yao <i>et al.</i>	(PDG Collab.)	REFID=51004
ARNDT	04	PR C69 035213	R.A. Arndt <i>et al.</i>	(GWU, TRIU)	REFID=49947
ARNDT	95	PR C52 2120	R.A. Arndt <i>et al.</i>	(VPI, BRCO)	REFID=44535
HOEHLER	93	πN Newsletter 9 1	G. Hohler	(KARL)	REFID=43821
ARNDT	91	PR D43 2131	R.A. Arndt <i>et al.</i>	(VPI, TELE) IJP	REFID=41467
BELL	83	NP B222 389	K.W. Bell <i>et al.</i>	(RL) IJP	REFID=30409
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky <i>et al.</i>	(CMU, LBL) IJP	REFID=30064
Also		PR D20 2839	R.E. Cutkosky <i>et al.</i>	(CMU, LBL) IJP	REFID=40096
SAXON	80	NP B162 522	D.H. Saxon <i>et al.</i>	(RHEL, BRIS) IJP	REFID=30404
HOEHLER	79	PDAT 12-1	G. Hohler <i>et al.</i>	(KARLT) IJP	REFID=30058
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP	REFID=30859
HENDRY	78	PRL 41 222	A.W. Hendry	(IND, LBL) IJP	REFID=30893
Also		ANP 136 1	A.W. Hendry	(IND)	REFID=30901
